

5 WHAT IS CLAIMED IS:

1. Paper having wet strength, temporary wet strength and dry strength properties comprising aldehyde modified cellulose pulp wherein the cellulose pulp has from about 1 to 20 mmoles of aldehyde per 100 g of cellulose.

10 2. ~~The paper of claim 1 wherein the cellulose pulp has from about 5 to 20 mmoles of aldehyde per 100 g of cellulose.~~

15 3. The paper of Claim 2 which has a wet strength to dry strength ratio of at least 20%.

4. The paper of Claim 3 wherein the paper has an improved compression strength and resistance of greater than about 1% over that of a paper prepared from a corresponding unmodified cellulose pulp.

5. The paper of Claim 4 wherein the paper has an improved compression strength and resistance of greater than about 5%.

20 6. The paper of claim 4 wherein the improved compression strength and resistance is measured under conditions of high humidity.

4 7. ~~The paper of Claim 2 wherein the cellulose pulp has a ratio of aldehyde to carboxylic acid functionality of about 0.2 or more.~~

5 8. The paper of Claim 7 which has a wet strength to dry strength ratio of at least 20%.

9. In the method of making paper having wet strength, temporary wet strength and dry strength properties, the improvement comprising using the aldehyde modified cellulosic material of Claim 1 as a pulp stock or a component of the pulp stock.

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~~10. The method of Claim 9 wherein the prepared paper has a wet strength/dry strength ratio of at least 20% or more.~~

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11. The method of claim 10 wherein the prepared paper has an improvement in compression strength and resistance of greater than about 1% over paper prepared from a corresponding unmodified cellulose pulp under standard environment conditions.

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~~The method of claim 11 wherein the prepared paper has an improvement in compression strength and resistance of greater than about 5%.~~

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The method of Claim 11 wherein the compression strength and resistance is measured under conditions of high humidity.

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~~14. The method of Claim 9 wherein the oxidant has an equivalent oxidizing power of from about 0.05 to 5.0 g of active chlorine per 100 g of cellulose.~~

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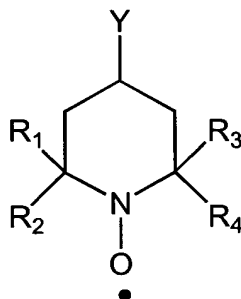
The method of Claim 14 wherein the oxidant is sodium hypochlorite or sodium hypobromite.

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102 "in vic" **Sub A'**
formula:

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The method of Claim 15 wherein the nitroxyl radical has the



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where Y is H, OH or NH-C(O)-CH₃.

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17. The method of Claim 16 wherein the prepared paper has a wet strength/dry strength ratio of at least 20%.

~~18. The method of Claim 16 wherein the aldehyde content of the~~
10 cellulose is from about 5 to 20 mmole/100 g of cellulose.

19. The method of Claim 18 wherein the oxidant is sodium hypobromite formed in situ by the addition of sodium hypochlorite and sodium bromide.

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20. The method of Claim 19 wherein the cellulose material has a ratio of aldehyde to generated carboxylic acid functionality of greater than or equal to 0.5 based on mmole/ 100 g of cellulose.

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21. The method of Claim 19 wherein from about 0.1 to 10% by weight of sodium hypochlorite based on the weight of cellulose and from about 0.1 to 5% by weight of sodium bromide based on the weight of cellulose are used.

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22. The method of Claim 21 wherein the prepared paper has a wet strength/dry strength ratio of at least 20%.

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~~23. Paper produced by the method of Claim 9.~~

24. Paper produced by the method of Claim 21.

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25. Paper produced ~~by~~ the method of Claim 16.

add B8

